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EINLADUNG zum IFP-SEMINAR

Thema: **Electronic Correlations and Thermoelectric Performance of $FeSb_2$ and (Sr,Ca)$MnBi_2$**

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Host: Silke Bühler-Paschen

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Ort: TU Wien, Institut für Festkörperphysik
Freihaus Seminarraum 138B, Turm C, 7. OG (rote Leitfarbe)
Wiedner Hauptstraße 8-10, 1040 Wien

Abstract:

I will discuss electronic correlations and thermoelectric performance of two model materials, $FeSb_2$ and (Sr,Ca)$MnBi_2$. $FeSb_2$ is a Kondo-insulator-like [1] narrow gap semiconductor [2] similar to FeSi [3] that was found to host a record-high thermoelectric power factor (TPF) [4]. I will address how even higher values of TPF can be obtained by subtle conducting states that emerge from synthesis-induced metal-insulator transition and how high values of Seebeck coefficient can be rationalized within the electronic model of multiband thermoelectricity [5,6]. On the other hand, Dirac fermions have attracted great interest in recent years, as seen on the examples of materials like graphene and topological insulators [7,8]. In the second part of my talk I will discuss quantum transport in single crystals of (Sr,Ca)$MnBi_2$ and similar materials [9,10]. The results demonstrate the existence of two dimensional Dirac fermions in bulk crystals with bismuth or antimony square nets and show that such states are highly relevant for thermoelectric performance [11-12].
References: [1] Comments Condens. Matter Phys. 16, 155 (1992), [2] Phys. Rev. B 72, 045103 (2005), [3] Phys. Rev. B 56, 12916 (1997), [4] Europhys. Lett. 80, 17008 (2007), [5] Phys. Rev. B 82, 085104 (2010), [6] Phys. Rev. B 86, 115121 (2012), [7] Rev. Mod. Phys. 81, 109 (2009), [8] Rev. Mod. Phys. 82, 3045 (2010), [9] Phys. Rev. B 84, 220401 (2011), [10] Phys. Rev. B 85, 041101 (2011), [11] Appl. Phys. Lett. 100, 112111 (2012), [12] Appl. Phys. Lett. 99, 113110 (2011),

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